

CTIP STUDY PROBLEM STATEMENT
Request for Funding
FY 2002

FHWA Strategic Goal Area:

Environmental Stewardship

Project Title:

Effectiveness of fish passage culverts design

Background:

Over the past 15 years, more and more stream crossings are designed as fish passage culverts to allow migration of fish. A variety of designs have been used for fish passage culverts based on resource agency requirements and preferences, stream morphologies, fish types, and financial constraints. Even though the use of fish passage culverts have proliferated with the renewed emphasis on environment, the design guidance for such structure has not evolved sufficiently. The designs are still segmented and governed by the individual preferences. There is a strong need to investigate the effectiveness of these designs to better define the design criteria, identify the critical factors for design, and standardize the design based on these critical factors.

Objectives:

During this field-study, qualitative and quantitative review will be performed for fish passage culverts already in operation for some time. The intention is to learn from better designs while avoiding the designs that do not meet functional requirements. This study will be conducted in cooperation with resource agencies so that we can incorporate their critical functional requirements in the design guidance.

The various aspects of stream crossings will be investigated: hydrology, morphology, and ecology. The physical aspects of the stream crossings will be evaluated both qualitatively and quantitatively to assess its effectiveness in matching stream morphology while allowing migration of fish. The designs will be rated on a numerical scale based on their overall performance. The critical factors that caused unsatisfactory performance will be identified and evaluated.

The study will produce a design guidance report that will focus on consistent design based on stream parameters. This will provide us with a set of standard designs that can be incorporated into future projects in a cost-effective manner.

Status:

At present, each fish passage culvert is designed to meet individual preferences of the WFLHD customer. A performance review of the various designs is not performed and their effectiveness is not investigated after the construction. Since there is no actual data, it is hard to justify a standard design to resource agencies. WFLHD is designing different fish passage culverts for same size streams in different states.

Expected Products and Milestones by Fiscal Year:

During FY2002 a study plan will be finalized based on the initial critical factors identified during the field investigations. A detailed survey will be designed for qualitative and quantitative assessment of existing fish passage culverts.

During FY2003, additional detailed field investigations will be performed to include a broad spectrum of designs and geographical areas. A final report will be presented at the end of the study period.

Duration:

May 2002-September 2003

Estimated Cost by Fiscal Year:

FY2002: \$5,000; Travel for field investigations

FY2003: \$15,000, Travel for filed investigations

Suggested Organization Method:

Initial field investigations will be performed to identify the critical factors for assessing the effectiveness of fish passage culverts. Based on these investigations, a survey will be designed and will be sent out to all previous WFLHD customers for evaluating previous fish passage culvert installations. Based on the survey response, a cross-section of designs will be selected for additional detailed field investigations. The results from analysis of survey data and field investigations will be summarized in a final report.

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